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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/716,272	11/21/2000	Hans-Jurgen Dr. Matt	Q61703	8430

7590 07/19/2004

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EXAMINER
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NOLAN, DANIEL A

ART UNIT	PAPER NUMBER
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2654

DATE MAILED: 07/19/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

09/716,272

**Applicant(s)**

DR. MATT ET AL.

**Examiner**

Daniel A. Nolan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 November 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3,8 and 9 is/are rejected.
- 7) ☒ Claim(s) 2,4-7 and 10-23 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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## DETAILED ACTION

### *Specification*

1. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

### Claims

2. It is noted without objection that claim 18 contains the adverb *approximately*. It is suggested to use the more standard 'substantially'.
3. It is noted without objection that claim 1, while technically being supported by the specification, when read without undue study is subject to misinterpretation. Indenting the wording to reflect the structure will prevent errors of misunderstanding in the future. See MPEP 37 CFR 1.77, which reads in part:

Arrangement of the Specification provided in 37 CFR 1.77(b):

- (i) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet (37 CFR 1.52(b)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).

The Examiner is proceeding with the understanding that the claim is to be read as follows:

1. A method of reducing echo and/or noise signals in telecommunications systems for transmitting useful acoustic signals, particularly human speech, comprising:  
determining by silence detection when the mixture of useful signals and interference signals contains a speech signal or when a silence interval is present, and

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-- varying, by means of a two-input multiplier, the amplitude of the useful signals, which are generally disturbed by echo and/or noise signals, in response to  
a time-dependent control signal  $a_o(t)$  or  
a control signal  $a_o(k)$  clocked at a sampling rate  $\frac{1}{T}$ ,  
where  $N$  denotes the number of samples, and  
 $T$  denotes the period from one sample to the next,  
characterized in that:  
the control signal  $a_o(t)$  or  $a_o(k)$  is varied in such a way:  
that in the presence of speech signals in the useful signal, the amplitude of the control signal  $a_o(t)$  or  $a_o(k)$  is set to a predetermined constant value  $c_o$ ;  
that from the beginning of a silence interval in the useful signal, the amplitude of the control signal  $a_o(t)$  or  $a_o(k)$  is continuously reduced from one sample to the next according to the recursion formula  $a_o(k) = a_o(k-1) \cdot \alpha$ , and  
that after the end of a silence interval,  $a_o(k)$  is set equal to  $c_o$ .

### **Claim Rejections - 35 USC § 112**

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claims 1, 3, 8, 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

6. Claim 1 recites the limitation "*the mixture of useful and interference signals*" in lines 3-4. There is insufficient antecedent basis for this limitation in the claim.

7. A broad range or limitation together with a narrow range or limitation that falls within the broad range or limitation (in the same claim) is considered indefinite, since the resulting claim does not clearly set forth the metes and bounds of the patent protection desired. Note the explanation given by the Board of Patent Appeals and Interferences in *Ex parte Wu*, 10 USPQ2d 2031, 2033 (Bd. Pat. App. & Inter. 1989), as

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to where broad language is followed by "such as" and then narrow language. The Board stated that this can render a claim indefinite by raising a question or doubt as to whether the feature introduced by such language is (a) merely exemplary of the remainder of the claim, and therefore not required, or (b) a required feature of the claims. Note also, for example, the decisions of *Ex parte Steigewald*, 131 USPQ 74 (Bd. App. 1961); *Ex parte Hall*, 83 USPQ 38 (Bd. App. 1948); and *Ex parte Hasche*, 86 USPQ 481 (Bd. App. 1949).

In the present instance, claims 3, 8 and 9 contain 'preferably', which is improper because the claim is trying to use both broad and narrow concepts in the same clause.

Claim 3 recites the broad recitation "*between 50 ms and 150 ms*" and the claim also recites "*~65 ms*" which is the narrower statement of the range/limitation.

Claim 8 recites broad recitations such as "*10dB to 15dB*" (last line page 2) and the claim also recites "*~12dB*" (1<sup>st</sup> line page 3) which is the narrower statement of the range/limitation. Similar broad/narrow constructions are in lines 2 & 3 of the claim.

Claim 9 recites the broad recitation "*in all its sections*" and the claim also recites "*at least in sections*" which is the narrower statement of the range/limitation.

### ***Allowable Subject Matter***

8. Claim 1 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

9. Claims 3, 8 and 9 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

10. Claims 2, 4-7 and 10-23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

11. The following is a statement of reasons for the indication of allowable subject matter:

- The present invention is directed to reducing echo/noise between speech signals.
- Regarding claim 1, the prior art of Li reads on the feature of determining by silence detection when the mixture of useful signals and interference signals contains a speech signal or when a silence interval is present (80→SID frame in figure 6), and on the feature of *varying, by means of a two-input multiplier, the amplitude of the useful signals, which are generally disturbed by echo and/or noise signals,* (200→198 in figure 13 – see column 32 line 30).

Williamson III reads on the feature of *varying in response to a time-dependent control* (column 4 lines 27-52) *that the control signal  $a_o(t)$  or  $a_o(k)$  is varied in such a way that in the presence of speech signals in the useful signal, the amplitude of the control signal  $a_o(t)$  or  $a_o(k)$  is set to a predetermined constant value  $c_o$*  (Abstract line 11 & claim 9 lines 32-38 – see column 4 lines 35-41); but the features *that, from the*

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*beginning of a silence interval in the useful signal, the amplitude of the control signal  $a_o(t)$  or  $a_o(k)$  is continuously reduced from one sample to the next according to the recursion formula  $\langle FORMULA \rangle$ , and that after the end of a silence interval,  $a_o(k)$  is set equal to  $c_o$*  are neither anticipated nor were they found in obvious combination in the

prior art of record.

- Claims 2-23 depend on claims that were found to be allowable and so would be allowed themselves for that reason.

### **Conclusion**

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Dehandschutter et al ("Real-Time Enhancement Of Reference Signals For Feedforward Control Of Random Noise Due To Multiple Uncorrelated Sources", IEEE Transactions on Signal Processing, January 1998) real-time algorithm based on recursive singular value decomposition (SVD) techniques reduce controller dimensions and computational burden.
- Li (U.S. Patent 6,549,587 B1) voice and data exchange over a packet based network with timing recovery.
- Koike (Japan Patent 11-007306) an adaptive filter for controlling a step size so that a residual error after convergence can be reduced, and high speed attained.

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- Vogten et al (U.S. Patent 4,374,302 A) arrangement and method for generating a speech signal.
- Williamson III (U.S. Patent 5,369,711 A) automatic gain control for a headset.
- Borth et al (U.S. Patent 4,630,304 A) automatic background noise estimator for a noise suppression system.
- Yamazaki et al (Japan Patent 04-082317) coefficients of the general recursive adaptive filter varied adaptively when the filter is employed for the canceller to suppress an echo with a long tail.
- Yamamoto et al (Japan Patent 57-212831) echo cancellation using a recursive filter, providing recursion to forecast (control device).
- Martinez et al ("Implementation Of An Adaptive Noise Canceller On TMS320C31-50 For Non-Stationary Environments", 13<sup>th</sup> International Conference on Digital Signal Processing Proceedings, July 1997) time-domain with recursive least squares lattice-ladder filters with a posteriori updating show best canceling.

12. Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Daniel A. Nolan at telephone (703) 305-1368 whose normal business hours are Mon, Tue, Thu & Fri, from 7 AM to 5 PM.

If attempts to contact the examiner by telephone are unsuccessful, supervisor Richemond Dorvil can be reached at (703)305-9645.

The fax phone number for Technology Center 2600 is (703)872-9314. Label informal and draft communications as "DRAFT" or "PROPOSED", & designate formal



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communications as "EXPEDITED PROCEDURE". Formal response to this action may be faxed according to the above instructions,

or mailed to:

P.O. Box 1450  
Alexandria, VA 22313-1450

or hand-deliver to: Crystal Park 2,  
2121 Crystal Drive, Arlington, VA,  
Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to Technology Center 2600 Customer Service Office at telephone number (703) 306-0377.

Daniel A. Nolan  
Examiner  
Art Unit 2654

DAN/d  
July 12, 2004



**RICHEMOND DORVIL**  
**SUPERVISORY PATENT EXAMINER**